Student report examines the future of a growing metro area

Where will the next million residents live?

Sean Selman
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More than a million new residents are expected to move into the Atlanta metropolitan region by 2025, and a report produced by students at Georgia Tech examines where they all might live, work and play.

The report, "Alternative Land Use Futures: Metropolitan Atlanta 2025," is a good example of the types of projects and programs sponsored by the new Center for Quality Growth and Regional Development, part of the College of Architecture.

A group of six graduate students in Tech's City and Regional Planning Program — with the support of the Center for Quality Growth and Regional Development — produced the report as a project for their Regional Land Use Studio. The students drew several conclusions after sifting through mounds of data on employment, population, land use and other key demographics provided by the Atlanta Regional Commission, Georgia Tech's Center for Geographic Information Systems and other entities.

Their overall analysis shows several ways for the Atlanta region to accommodate anticipated growth and reduce its ongoing sprawl outward from the city's core. In fact, the graduate students found that the influx of new residents can be accommodated using land-use patterns that are more efficient and produce fewer environmental impacts than the type of low-density sprawl that has characterized Atlanta's growth to date.

"The purpose of this studio was to inform the ongoing discussion of possible land-use futures for the Atlanta region," said Steven French, a professor in the City and Regional Planning Program, the faculty adviser on the project. "This report is intended to help citizens and decision makers understand the scope and the type of the land-use changes that are needed to accommodate likely future growth," French said.

In their report, the students first identified the challenges facing Atlanta. They used data to show, for example, that in 1970 the Atlanta metropolitan region was home to 1.5 million people. By 2000, that number had jumped to more than 3.6 million.

Geographically, the Atlanta metropolitan region expanded faster than any other urbanized area in history during the 1990s. Estimates are that the region grew from 68 miles north-to-south to 121 miles north-to-south between 1990 and 1997.

In total, the population of the 13 counties that make up the Atlanta metropolitan region grew by 59 percent during the 1990s, making it the fastest growing region in the country. This pace is expected to slow during the next few years, but it will lead to an influx of about 1.1 million new residents by 2025, according to the report.

In the past, Atlanta has dealt with incoming population by expanding outward, mostly to the north of the city core. But the graduate researchers developed three alternative land-use scenarios, each with a different guiding theme for Atlanta's future growth that keeps outward sprawl to a minimum.

One scenario, for example, focuses on environmental protection by steering growth toward the already-developed urban core. This scenario also seeks to preserve open spaces, which are critically needed to reduce the ambient temperature of the region and to help keep water clean.

A second scenario creates a development pattern that follows transportation corridors, locating new homes and jobs along existing or anticipated highways, rail lines or bus routes.

The final scenario suggests patterns of development in nodes, or activity centers, which have begun to develop throughout the region — areas such as Buckhead, Midtown or Downtown. The goal of this scenario was to concentrate new residents in these areas and encourage mixed-use developments — places such as the neighborhood surrounding

Biomedical engineering program dedicates a new facility

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To paraphrase University System Chancellor Thomas Meridith, this is becoming routine. For the third time in as many weeks, Georgia Tech christened a new multimillion-dollar project.

Coming on the heels of Technology Square and GT-Savannah, College of Engineering Dean Don Giddens dedicated the dedication of the U.A. Whitaker Biomedical Engineering Building, which will house teaching and research endeavors for its joint department of biomedical engineering with Emory University.

"In unifying the talents of faculty and students at both universities," Giddens said, the field of biomedical engineering is witnessing the inaugural partnership between a public and a private institution that he hopes will serve as an example for other universities.

The U.A. Whitaker Building provides 90,000 square feet of faculty offices, classroom instruction space and instructional laboratories. The building will also house 25 faculty researchers supported by five large labs.

The research pursuits of the program include medical imaging, computer-assisted surgery, medical devices and more efficient delivery of drugs to disease sites.

The $23 million facility is the end

A centennial of flight

In a daylong event Oct. 21, the School of Aerospace Engineering celebrated contributions to the field of flight with a number of prominent speakers, including former astronaut Scott Horowitz, who flew on four space shuttle missions between 1996-2001. Horowitz graduated from Tech in 1982.

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Virtual reality as a training tool for fighting fires

Elizabeth Campbell
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The numbers are staggering: the National Fire Protection Association calculates deaths and property losses at $3.9 billion and $9.6 billion, annually. Consequently, firefighters need the best training possible to react to emergencies in the most effective way.

In an effort to achieve that goal, the Atlanta Fire Department approached Georgia Tech about developing a fire command training simulator to better prepare their officers to react in emergencies. In these collaborations, Tech researchers are refining a training application using virtual environment technology to better train fire commanders directing teams of firefighters.

“ar the key here is the safety of the firefighters,” says W.O. May, captain and special projects coordinator for the Atlanta Fire Department. “By reducing the dangers involved in training, we can greatly lower the chance of a firefighter injury.”

Creating a scenario

This application simulates the progress of a fire in a single-family home and responds to the orders made by the fire commander on the scene. The virtual environment allows the user to navigate the fire scene and view a house on fire from any angle; to direct firefighters and watch them execute commands; and see realistic fire and smoke behavior reacting to such environmental changes as the opening of windows.

“The world that firefighters work in is incredibly complex. Every fire and every situation is different, so a virtual environment, which can be changed fairly easily, is a good fit for this type of training,” says Chris Shaw, senior research scientist in the College of Computing and faculty member of the Graphics, Visualization and Usability (GVU) Center, who leads the project.

The Firefighter Command Training Virtual Environment is designed as a training tool to be used by an officer commanding a four- to eight-person company responding to fire emergencies. Officers have a number of years of experience as firefighters in addition to classroom training and practicing command procedures at the department’s training ground.

But these methods have shortcomings. First, not all fire companies see all types of emergencies in equal amounts; some companies may see many more fires than others. Second, most training grounds have one fireproof building, limiting realism and the element of surprise.

Making it real

A virtual environment, on the other hand, can provide a variety of scenarios in a more realistic way with less risk and expense.

“When I came to Georgia Tech for graduate school, I was interested in working in computer graphics and with virtual reality, so this project was a good fit,” said Tazama St. Julien, third-year computer science Ph.D. student. “The visit to the actual fire training ground and seeing fires up close and personal was pretty interesting.”

In the prototype application, Shaw and his team of students created a virtual environment in which the user sees a house on fire via a computer screen or a head-mounted display. As in a real fire, verbal commands are given to an operator, who enters the commands into the simulation. This arrangement eliminates problems inherent to voice recognition software, and also allows the operator to set up mistakes or traps for the user, again creating a more realistic experience. The user sees animated firefighters reacting to commands, with the smoke and fire patterns shifting in response.

The project has proven technically challenging. The Atlanta Fire Department told us that accuracy is important. If the fire in our virtual environment doesn’t respond as a real fire would, then it’s not very useful as a training tool. So we’ve concentrated on accuracy in the amount of smoke and fire produced, which is a huge amount of data to calculate,” said Shaw.

Significant improvements have been made since the original prototype was created. Originally, the animated firefighters moved like robots; now the application includes motion scripts to make the firefighters’ movements more realistic.

“It has been amazing to see this project develop. We have firefighters that can walk, climb ladders, ventilate a roof, spray water, etc. The fire is very realistic, not only in the way it looks, but in its behavior as well,” says May.

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Technology Square, where people might live, work and play within the same part of the city.

“The purpose of this study was not to identify the best land-use pattern for the region, but to show citizens and decision makers the range of possible options that are available to them,” French said. “To date the project has been successful in encouraging discussion about how the Atlanta region can accommodate the large amount of growth that is expected in the next 20 years, which was an important goal of the students’ project.”
result of an initiative begun 15 years ago by Tech faculty members seeking to create an interdisciplinary program bridging the health and engineering sciences. By 1997, Tech and Emory University were studying the feasibility of a joint program. Former Provost and Vice President Michael Thomas and Emory Dean of Medicine Thomas Lawley established an advisory committee to assess this proposition. A few months later, the partnership was approved.

Even before having its own facility, the biomedical engineering program was regarded as one of the nation’s best. Current rankings by U.S. News and World Report list Tech’s graduate and undergraduate programs as sixth and seventh, respectively.

Together with the Ford Environmental Science and Technology Building and the Petit Biotechnology Building, the Whitaker Building is the third phase of the new Life Sciences and Technology Complex. A fourth building — for materials and molecular science, with a focus on biotechnology, and environmental and sustainable technologies — is currently in the fundraising and planning stages.

For the speakers, the tone was a mixture of excitement and expectation.

Metro high school students experience ‘A Day in the Life’

Last week, students from local high schools got a taste of college life by shadowing volunteer college students for a day at area universities. The “A Day in the Life” events on the campuses of Clark Atlanta, Emory, Georgia State and Georgia Tech give students a chance to visit a college campus, experience a class and get answers about college.

“While being exposed to the campus atmosphere, these high school students can learn just how their hard work in school can pay off with well-earned success in the real world,” said Christopher Olinde, an electrical engineering undergraduate and volunteer.

The four research institutions comprise the Atlanta Outreach Consortium (AOC) — an effort to pool the universities’ community outreach resources in the metropolitan Atlanta area. Last year’s inaugural event involved about 230 students from eight high schools. This year, the host universities will follow up with the participating students, tracking their progress, graduation rates and whether they go to college.

“When students can see themselves on a college campus, in a college classroom, and enjoying college life, they reach for higher goals. The Atlanta Outreach Consortium is helping Atlanta Public Schools’ students dream bigger and work harder for a college career after high school,” said Beverly Hall, superintendent of Atlanta Public Schools.

Web invoice system receives best practice award

The University System of Georgia recently acknowledged Georgia Tech during its annual “Best Practices” competition for a system that puts a student’s invoice statement on the Web. Joel Herrick, associate vice president for financial services, accepted the award last month at a reception in Valdosta.

Taking advantage of available technology to increase customer service, Tech created a student Web invoice statement to replace the prior statement format and process of mailing paper bills to students. Beginning with the 2002 fall semester, students could access their invoice statement over the Web at their convenience, obtaining the most current information on their account. Charges and payments are reflected immediately on the invoice.

The system resulted in a 50 percent cost reduction in preparing invoices and a 65 percent postage expense reduction, and significantly reduced the need for temporary registration to process the invoices.

“We are continuing to strive to make our administrative systems as successful as our academic,” said President Wayne Clough. “This Web-based invoice system is an excellent example of system innovation that both saves money and enhances service to our students. It’s an excellent example of administrative innovation, and I look forward to future improvements.”

IN BRIEF:

Clough named to mayor’s Economic Development Committee

President Clough is joining Mayor Shirley Franklin and metro-Atlanta business leaders to revitalize the city’s economy. A member of Franklin’s new Atlanta Committee for Progress (ACP), Clough will provide counsel and support to the mayor on major economic development issues. The ACP is comprised of business and civic leaders such as Delta CEO Leo Munin, UPS CEO Mike Eskew and Director for the Centers for Disease Control and Prevention Julie Gerberding. Also on board are Clark Atlanta President Walter Massey and Carl Ware, chairman of the Clark Atlanta Board of Trustees. The committee is modeled after similar groups in other cities.

The new committee is part of the mayor’s four-step economic development initiative that includes the New Century Economic Development Plan, designed to create the city’s economic vision. The mayor also plans to revamp the Atlanta Development Authority and increase staffing at the city’s Department of Planning.

No stranger to public service, Clough is a member of President Bush’s President’s Council of Advisors on Science and Technology. Over the past few years, Clough has served as chairman of Mayor Franklin’s Clean Water Task Force and Gov. Sonny Perdue’s Telecommunications and Technology Task Force.

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**Nov. 14**
The bookstore will host the Georgia Poetry Society’s open mic night, featuring Robert Gianetti and Karen Wurl. Sign-ups begin at 7 p.m.

**Nov. 17**
Ivan Allen College’s Poetry at Tech welcomes poets from the state of Georgia — Anthony Sellman, Eric Nelson and Larry Rubin — at 4:30 p.m. in the Clary Theater. No tickets are required.

**Brown Bags/Conferences/Lectures**

**Nov. 13**
The School of Electrical and Computer Engineering’s annual Carreker Distinguished Lecture welcomes Henry Samueli, founder and chairman of Broadcom, on “Online All The Time: How Wireless Connectivity Will Be in Everything,” at 5:30 p.m. in the Van Leer Auditorium.

**Nov. 14**
The Center for Research on Embedded Systems and Technology’s Distinguished Lecture features K. Mani Chandy, professor of computer science at the California Institute of Technology, on “The Event Web,” at 1 p.m. in the Tech Square Research Building Auditorium. For more information, e-mail jinaa@ece.gatech.edu.

**Nov. 18**
The School of Materials Science and Engineering’s Seminar Series welcomes Douglas Chrisey of the U.S. Naval Research Laboratory on “Rapid Prototyping of Living Biological Systems,” at 3 p.m. in room 185, Love Building. For more information, e-mail roger.nanayan@nres.gatech.edu.

**Nov. 19**
The DuPree College of Management’s IMPACT Speaker Series welcomes John Festa, CEO of CareCentric, at 8:30 p.m. in the LeCraw Auditorium. For more information, visit www.dupree.gatech.edu/impact.

**Nov. 20**
The Graphics, Visualization and Usability (GVU) Center hosts a brown bag featuring Associate Professor Irfan Essa on “Digital Video Special Effects: Research and Educational Endeavors,” at noon in room 162, MRC. For more information, call 894-4488.

**Faculty/Staff Development**

**Nov. 18**
The Office of Sponsored Programs’ brown bag series on “Subawards” will be at noon in room 119, Centennial Research Building. To register, call 894-6944.

**Nov. 18**
The Office of Organizational Development sponsors a free class in “Creating Effective Intercultural Interactions,” from 11:30 a.m. - 1 p.m. in room 308, Savant Building. To register, visit www.trainswb.gatech.edu.

**Classifieds**

**Nov. 20**
The Center for the Enhancement of Teaching and Learning’s Faculty Development Seminar Series continues with “Demystifying Ethics Education,” presented by Robert Kirkman, assistant professor in the School of Political Policy, at 11 a.m. in the Library’s Homer Rice Center. Lunch will be provided to those who register by calling 894-9418.

**Nov. 21**
The Office of Organizational Development sponsors a free class in “Survival Spanish,” from 11:30 a.m. - 1 p.m. in room 308, Savant Building. To register, visit www.trainswb.gatech.edu.

**Miscellaneous**

**Nov. 15**
The Office of Government Relations holds its annual Legislative Network Fall Briefing. State government and Board of Regents’ officials will join President Wayne Clough to discuss the University System’s budget priorities and news about the state’s overall economic outlook, beginning two and a half hours before kickoff of the Georgia Tech/University of North Carolina football game. Advance registration is required. Call 894-1258 or e-mail lisa.nayyar@dev.gatech.edu.

**Nov. 19-20**
A TIAA-CREF consultant will be on campus to conduct free financial planning sessions. To sign up, call 800-842-2003 or visit www.tiaa-crref.org/moc.